

No. 6 — *The Tenuis and Selenophora Groups of the Ant Genus  
Ponera (Hymenoptera: Formicidae)*

By EDWARD O. WILSON

When W. M. Wheeler created the new genus *Pseudocryptopone* (generitype: *Cryptopone tenuis* Emery) in 1933, it was with the free acknowledgment that this entity could not be clearly separated from *Ponera*. "Indeed, I confess my inability to draw a sharp line of demarcation between the two genera. One of the species, *incerta*, new species, which I have assigned to *Pseudocryptopone*, might, with equal propriety, be placed in *Ponera*." The purpose of this exceptional procedure was to begin a preliminary, orderly reduction of *Ponera*. "*Ponera* is now a large and very difficult genus in great need of careful revision. The monographer who undertakes this task will very probably divide it into several subgenera or even genera and his definition of these will automatically determine their relations to *Pseudocryptopone* and therefore its true status and affinities." In a similar fashion, Wheeler withdrew two Papuan species of *Ponera* (*selenophora* and *clavicornis*) and combined them with a new Philippine species (*oreas*) to form a second new genus, *Selenopone*.

Although Wheeler's aim to partition *Ponera* and thereby simplify its classification was an admirable one, the formal naming of new genera on such feeble evidence as he proposed was not well justified. A more recent examination of *Pseudocryptopone* and *Selenopone*, along with many of the related Indo-Australian species of *Ponera*, has convinced the present writer that Wheeler's genera cannot be maintained on the basis of even the most liberal criteria. To begin, *Pseudocryptopone* is linked to *Ponera* by the intermediate species *Ponera mocsaryi* Emery, which shows a combination of *Ponera* and *Pseudocryptopone* characters. These two genera are further linked by several species more closely allied to the *Pseudocryptopone* generitype, but which tend strongly toward the more typical *Ponera* type, e.g., *Ponera incerta* (Wheeler), *P. ratardorum* Wilson, and *P. huonica* Wilson. Similarly, *Selenopone* is linked to *Ponera* by the intermediate *Ponera syscena* Wilson, and is closely approached within

the ranks of the "typical" *Ponera* by the species *P. papuana* Emery. Finally, *Pseudocryptopone* and *Selenopone* are linked to one another by several more or less intermediate species, including *Ponera clavicornis* Emery, *P. tenuis* (Emery), and *P. huonica* Wilson.

In short, there does not appear at present to be any basis for a generic split along the lines proposed by Wheeler. The following synonymy is accordingly proposed:

### Genus PONERA Latreille

*Ponera* Latreille, 1804, *Nouv. Diet. Hist. Nat.*, 24: 178-179. Generitype: *Formica coarctata* Latreille (= *Formica contracta* Latreille), by subsequent selection.

*Pseudocryptopone* Wheeler, 1933, *Amer. Mus. Nov.*, no. 672: 12-13. Generitype: *Cryptopone tenuis* Emery, original designation. NEW SYNONYMY.

*Selenopone* Wheeler, 1933, *ibid.*, p. 19. Generitype: *Ponera selenophora* Emery, original designation. NEW SYNONYMY.

*Pseudocryptopone* and *Selenopone* are of course available as subgeneric names if any reason is found to make formal subgeneric divisions in future revisions of *Ponera*. In the present study, however, the entities considered are the two *species groups* having affinities with *P. tenuis* and *P. selenophora* respectively. Both groups are herein much enlarged by the addition of a total of ten new species, most of which were collected by the author during a recent research tour in Melanesia. To the *selenophora* group have been added two older species (*scabra*, *sinensis*) which were apparently overlooked by Wheeler in his 1933 revision.

Together the *tenuis* and *selenophora* groups comprise a large and important section (approximately 50 per cent) of the Papuan species of *Ponera*, but the present evidence indicates that they diminish rapidly outside this area. In the *tenuis* group, a single species is known from Java and one each from the Caroline Islands, New Caledonia, and southeastern Australia. In the *selenophora* group, one species each is known from the Philippines, Hongkong, and southern Japan. It is possible that other described species from outside the Papuan region may be placed in these two groups when *Ponera* is more exhaustively studied.

At the moment the greatest concentration of species for both groups appears to exist at intermediate elevations (500-1600 meters) in the mountains of New Guinea. No less than five species, comprising 25 per cent of the total known, have been collected in a limited area around the headwaters of the Mongi River, Huon Peninsula. Further collecting in similar areas in other parts of New Guinea will probably yield a large proportion of the still undiscovered species.

The present contribution has been prepared as a preliminary part of a review of the ants of Melanesia. The remainder of the species of *Ponera* will be treated in a later part. Most of the type and other material used in this study is deposited in the Museum of Comparative Zoology at Harvard University. Other source collections have been the Emery Collection in Genoa; Dr. E. S. Ross' collection of New Guinea ants, deposited with the California Academy of Sciences; Dr. J. L. Gressitt's collection of Melanesian ants, deposited in the B. P. Bishop Museum, Honolulu; and Miss L. E. Cheesman's collection of New Hebridean ants, deposited in the British Museum of Natural History.

### Measurements

In the taxonomy of a genus such as *Ponera*, where species differences are for the most part minute and subtle, exact measurements are necessary for accurate species diagnoses. In the present study an ocular micrometer was used, and estimations were made to the nearest two-tenths of a unit of 0.0293 mm, or to 0.006 mm. Thus the *calculated* maximum error is  $\pm 0.006$  mm, but in practice, of course, the *actual* maximum error varies around this figure according to the specific measurement involved. Head width, as defined below, is probably the "safest" measurement; repetitive measurements have shown that the actual maximum error is no more than  $\pm 0.006$  mm. Scape length and petiolar node length are the least reliable measurements, but even here the actual maximum error probably does not exceed four-tenths of a micrometer unit either way, or  $\pm 0.012$  mm.

*Head width (HW)*. *Worker and queen*: the maximum width of the head held in perfect full face and excluding the eyes. If the eyes extend beyond the lateral borders of the head in this position, the measurement is taken across whatever parts of the

lateral borders are left exposed. *Male*: the maximum width of the head across and including the eyes.

*Head length (HL)*. The length of the head, held in perfect full face, measured from the level of the anteriormost point of the anterior clypeal border to the midpoint of the occipital border.

*Scape length (SL)*. The maximum length of the scape exclusive of the basal "neck."

*Cephalic index (CI)*. Head width  $\times$  100/head length.

*Scape index (SI)*. Scape length  $\times$  100/head width.

*Pronotal width (PW)*. The maximum width of the pronotum measured from directly above and at a right angle to the long axis of the alitrunk.

*Petiole height*. The height of the entire petiole, measured from the level of the crest of the petiolar node to the level of the lowermost point of the subpetiolar process.

*Petiolar node length*. When the petiole is held in exact side view, the distance from the midpoint of the curve where the anterior face of the node meets the anterior peduncle to the midpoint of the curve where the posterior face of the node meets the posterior peduncle.

*Dorsal petiole width*. The width of the petiolar node measured from directly above the node and at right angles to the long axis of the body.

#### Characterization of the *Ponera tenuis* group

*Worker*. Small species, worker head width never exceeding 0.43 mm, head subrectangular, elongate, cephalic index not exceeding 86; antennal scapes short, the scape index never greater than 90; antennal club massive, 4- or 5-jointed. Mandibles with three well formed teeth occupying the apical two-fifths to one-half of the masticatory border, the remainder of the border occupied by two smaller teeth plus a number of minute intercalary denticles (*P. huonica* Wilson only) or by denticles only (other species). Eyes minute, consisting of a single ommatidium, or altogether absent; when present, located 0.7 to 0.8 the distance from the occipital border to the midpoint of the anterior clypeal border. Junction of lateral and posterior faces of the propodeum rounded, not marginate. Petiolar node relatively thick, seen

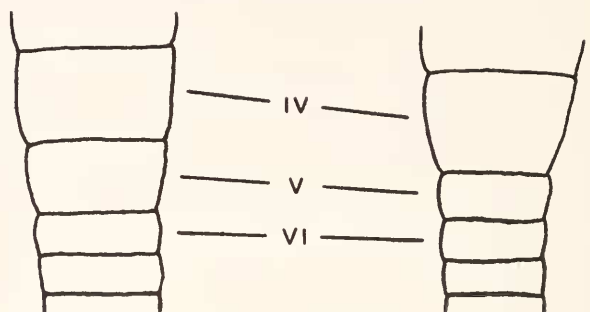


from the side, subrectangular, usually tapering very slightly dorsally; seen from directly above, its anterior face is more or less semicircular or arcuate, and its posterior face is straight to weakly concave. Subpetiolar process angular or subangular, and projecting posteriorly.

Key to the species of the *Ponera tenuis* group,  
based on the worker

1. Eyes absent .....2  
Eyes present, although represented only by a single ommatidium and often very inconspicuous .....3
2. Larger species, head width at least 0.44 mm; cephalic index at least 81; erect hairs numerous on scape, dorsum of alitrunk and entire surfaces of first two gastric tergites; antennal club indistinctly 5-jointed; body color clear yellow .....*zwalawenburgi* (Wheeler)  
Smaller species, head width no more than 0.30 mm; cephalic index not more than 78; erect hairs absent from scapes, alitrunk dorsum and from all but the posterior strips of the first two gastric tergites; antennal club distinctly 5-jointed; body color brownish yellow ....  
.....*swezeyi* (Wheeler)
3. Very small species, head width not exceeding 0.31 mm; (dorsal surface of petiolar node seen from directly above, so that the posterior face is level with the line of vision, forming in its entirety distinctly more than a half-circle, its width 0.15 mm or less; body color light yellowish brown); (New Guinea) .....*saboi* Wilson, nom. nov.  
Larger species, head width never less than 0.32 mm and often as much as 0.38 mm or more; (dorsal surface of petiolar node seen from above varying among species, from distinctly more than semicircular to distinctly less, its width never less than 0.18 mm; color variable between species, from light yellowish brown to very dark brown) .....4
4. Antennal club distinctly or indistinctly 5-jointed (see Fig. 1); (dorsal surface of petiolar node seen from directly above forming distinctly less than a half-circle) .....5  
Antennal club distinctly 4-jointed; (dorsal surface of petiolar node seen from above forming in various species from distinctly less than a half-circle to distinctly more) .....6
5. Body color a uniform yellowish brown; posterior border of petiolar node seen from directly above distinctly concave; (Java) .....  
.....*incerta* (Wheeler)  
Body color a uniform dark brown; posterior border of petiolar node

- seen from directly above almost perfectly straight; (New Britain to New Hebrides and Carolines) .....*ratardorum* Wilson, n. sp.
6. Smaller species, head width 0.34 mm or less; (body color clear yellow to yellowish brown) .....7
- Larger species, head width 0.38 mm or more; (body color varying among species, from light yellowish brown to dark brown) .....8



## RATARDORUM

## SZENTIVANYI

Fig. 1. Middle funicular segments in antennae of workers of two species of the *Poner a tenuis* group, showing the principal character used to divide couplet 4 of the key. Dorsal view, semidiagrammatic.

7. Lateral surfaces of alitrunk very feebly shagreened to smooth, and shining; petiolar node relatively low, its height in the unique type only 0.25 mm, or about the same as the pronotal width .....  
.....*petila* Wilson, n. sp.
- Lateral surfaces of alitrunk all moderately shagreened, and opaque; petiolar node proportionately higher, its height in the single specimen measurable 0.29 mm, or slightly more than the pronotal width, which is 0.27 mm .....*szentivanyi* Wilson, n. sp.
8. Cephalic index 80 to 86; width of petiolar node not greater than 0.22 mm; medium or dark brown species from New Guinea .....9
- Cephalic index 71 to 76; width of petiolar node not less than 0.22 mm; light yellowish brown or light reddish brown species from New Caledonia and Australia .....10
9. Dorsal surface of petiolar node seen from directly above forming distinctly more than a half-circle (see Fig. 2); posterior apex of subpetiolar process sharply truncated; slightly smaller species, head

- width 0.40-0.41 mm; head dark brown, remainder of body medium brown ..... *huonica* Wilson, n. sp.
- Dorsal surface of petiolar node seen from directly above forming almost an exact half-circle or very slightly less; posterior apex of subpetiolar process not truncated, but forming a full right-angle or an acute angle; slightly larger species, head width 0.42-0.44 mm; entire body uniformly dark brown ..... *tenuis* (Emery)
10. Slightly smaller species, pronotal width 0.29-0.30 mm; scape index 80-86; entire petiolar node when viewed from directly above forming almost an exact half-circle (see Fig. 2); (New Caledonia) ..... *caledonica* Wilson, n. sp.
- (Based on the unique worker type). Slightly larger species, pronotal width 0.32 mm; scape index 90; entire petiolar node when viewed from directly above forming distinctly more than a half-circle; (Victoria) ..... *exedra* Wilson, n. sp.

PONERA CALEDONICA Wilson, n. sp.

*Holotype worker.* HW 0.40 mm, HL 0.52 mm, SL 0.32 mm, CI 77, SI 80, PW 0.30 mm, petiole height 0.31 mm, petiolar node length 0.18 mm, dorsal petiole width 0.25 mm. Mandibles with three well developed teeth occupying approximately the apical two-fifths of the masticatory border; the remainder of the border occupied by an indeterminate number of minute denticles. Eyes minute, consisting of a single ommatidium. Antennal club distinctly 4-jointed, considerably longer than the entire remainder of the funiculus. Head seen in full-face view with nearly straight sides, feebly concave occipital border. Petiolar node in side view massive, subrectangular, tapering only very slightly dorsally; seen from directly above, its dorsal surface forming an almost exact half-circle, the posterior face concave. Subpetiolar process somewhat reduced, its apex right-angular.

Dorsum of head densely punctate and subopaque to opaque; sides of head also densely punctate, but the punctures relatively shallow and the surface feebly shining. Entire dorsal and lateral surfaces of the alitrunk covered by puncturation or shagreening<sup>1</sup> of variable density but everywhere shallow and feeble, so that the

<sup>1</sup> Shagreening as most rigorously defined means "covered with small, close-set tubercles, suggesting shagreen leather," or "with a pebbled surface like shagreen leather" (Webster's International Dictionary, unabridged, second edition). In the present descriptions I have employed a somewhat broader definition of common usage in entomology, using this term to cover in addition to minute tuberculation and pebbling any dense, irregular, minute sculpturing which cannot more precisely be described as puncturation, striolation, vermiculation, or reticulation.

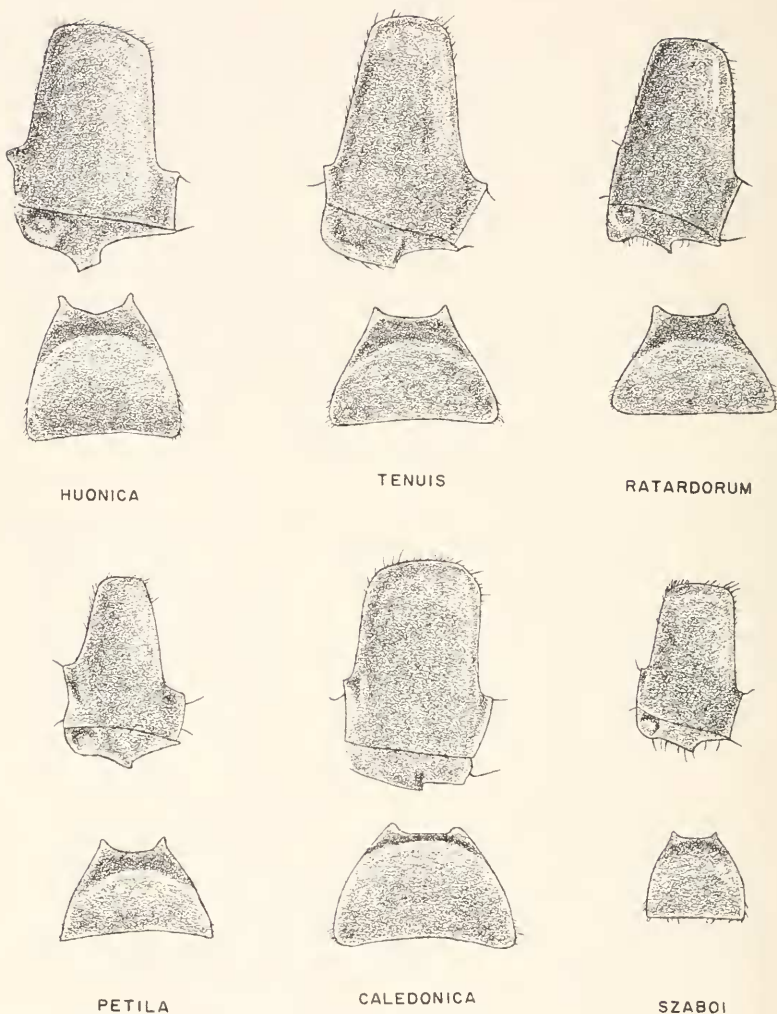


Fig. 2. Lateral and dorsal view of the worker petioles of selected species of the *Ponera tenuis* group. Top: left, *P. huonica* Wilson, holotype; middle, *P. tenuis* (Emery), worker from Ebabaang, New Guinea; right, *P. ratardorum* Wilson, holotype. Bottom: left, *P. petila* Wilson, holotype; middle, *P. caledonica* Wilson, holotype; right, *P. szaboi* Wilson, worker from the lower Busu River, New Guinea. Drawn approximately to scale.

surface varies from feebly to strongly shining. The dorsal petiolar surface and gastric tergites are also feebly sculptured and their surfaces overall feebly shining.

Body pilosity sparse, being limited almost entirely to a few hairs on the anterior clypeal border, posterodorsal border of the petiolar node, and entire surfaces of the gastric tergites. Appendages mostly bare, except for terminal surfaces of tibiae and tarsal segments. Body and appendage pubescence everywhere dense, very short and predominantly oblique to appressed.

Body concolorous yellowish ferruginous; appendages light brownish yellow to clear yellow.

*Worker paratype variation.* HW 0.38-0.40 mm, HL 0.51-0.52 mm, SL 0.32-0.33 mm, CI 73-76, SI 83-86, PW 0.29-0.30 mm.

*Queen paratype.* HW 0.41 mm, HL 0.54 mm, SL 0.36 mm, CI 76, SI 87, maximum eye length 0.09 mm, dorsal petiole width 0.26 mm. Distinguished from the worker by the usual queen-worker caste differences. As in the queens of many other species of *Ponera*, the petiolar node is much thinner than in the worker caste, forming distinctly less than a half-circle when viewed from directly above.

*Relationships.* *P. caledonica* forms with *P. exedra* Wilson of Australia a discrete subgroup of the *tenuis* group, characterized in the worker caste by relatively large size, elongated head, thick petiolar node, and light coloration. The closest affinities of the *caledonica* subgroup are evidently with the *szeivanyi* subgroup (*szeivanyi* and *petila*). *P. caledonica* can be distinguished from *P. exedra* by its smaller size, thinner node, and lighter color.

*Material examined.* NEW CALEDONIA: Ciu, near Mt. Canala, 300 m. (type locality), January 3, 1955, berlese sample of 12 workers and 1 dealate queen (E. O. Wilson); Mt. Mou, 180 m., December 11, 1954, 2 workers (Wilson, acc. no. 128), and berlese samples of Dec. 12 and 27, 1954, 3 workers; Chapeau Gendarme (Yahoué), Dec. 7, 1954, berlese sample of a single worker (Wilson).

*Ecological note.* This is apparently a rather scarce cryptobiotic species in New Caledonia. Despite rather intensive hand collecting by the author in the localities cited above, only once (acc. no. 128) was it encountered directly. In this case two workers were found with a small amount of brood in a small cavity in the

undersurface of a rock set deeply in the soil. These individuals were rather sluggish, and when prodded with the tip of a pair of forceps, rolled up and feigned death for a short while, a behavioral response common in other species of *Ponera*. All of the other collections of *caldonica* were made by filtering the ants from masses of leaf litter and soil in a Berlese funnel. The collections at Mt. Mou and Chapeau Gendarme were made in relatively dry, semi-deciduous, valley-pocket forests, while that at Ciu was in moister tropical evergreen forest.

*PONERA EXEDRA* Wilson, n. sp.

*Holotype worker.* HW 0.38 mm, HL 0.54 mm, SL 0.34 mm, CI 71, SI 90, PW 0.32 mm, petiole height 0.30 mm, petiolar node length 0.20 mm, dorsal petiole width 0.24 mm. This species is very close to *P. caldonica* Wilson, and is distinguished by its slightly larger size, more elongate head, and longer scapes, as indicated in the measurements cited above. It also has a distinctly thicker petiolar node; when viewed from directly above, the entire surface of the node forms slightly but distinctly more than a half-circle. In addition, the subpetiolar process is somewhat more reduced, and its apical angle is obtuse.

*Queen paratype.* (Tentative determination). HW 0.40 mm, HL 0.54 mm, SL 0.35 mm, CI 74, SI 88, petiolar node length 0.21 mm, dorsal petiole width 0.25 mm. Distinguished from the worker by the usual queen-worker caste differences. Maximum eye length 0.11 mm. Petiolar node thinner and more sharply tapering than in worker; seen from directly above, the dorsal surface of the node alone forms distinctly less than a half-circle, but the entire node forms distinctly more. Head (except mandibles) and first three gastric tergites medium brown; alitrunk and petiole somewhat lighter yellowish brown; mandibles and appendages brownish yellow to clear yellow.

*Relationships.* See under *P. caldonica*.

*Material examined.* VICTORIA: Arthurs Seat (mountain) at McCrae, 100-300 m. (type locality); April 28, 1951; a single worker (W. L. Brown). NEW SOUTH WALES: Pymble; October 23, 1950; a single dealate queen (Brown).

*Ecological notes.* Dr. Brown has supplied me with the following information relative to the Arthurs Seat worker. This speci-



men was found under a rock in granitic soil in a medium rainfall forest of *Eucalyptis viminalis*, *E. radiata* and *Banksia* sp. Brown notes that the ant fauna of Arthurs Seat is unusual for this part of Victoria, containing a number of distinctly northern elements, e. g. *Mayriella abstinens* Forel and *Camponotus intrepidus* (Kirby). Thus the discovery of the *Ponera exedra* queen at Pymble, N. S. W., hundreds of miles to the north, is not too surprising. This latter specimen was collected from beneath a rock in medium, dry sclerophyll forest on sandstone.

The close affinities of *P. exedra* to *P. caledonica* are of considerable interest, inasmuch as they represent another of a growing series of known links at the species-group level between the ant faunas of New Caledonia and eastern Australia.

#### PONERA HUONICA Wilson, n. sp.

*Holotype worker.* HW 0.41 mm, HL 0.49 mm, SL 0.33 mm, CI 84, SI 81, petiole height 0.33 mm, petiolar node length 0.18 mm, dorsal petiole width 0.22 mm. Right mandible with three teeth occupying the apical half of the masticatory border, a smaller tooth situated approximately midway between the basal-most of the apical teeth and the basal angle, and an even smaller, barely distinguishable tooth on the basal angle. There are no intercalary denticles evident at magnifications up to 100X; higher magnifications were not used. The left mandible is similar, but the median tooth described above is smaller and rudimentary. Eye minute, consisting of a single ommatidium. Antennal club massive, distinctly 4-jointed, slightly longer than the remainder of the funiculus. Head shape about as described in *P. szaboi* Wilson. Petiolar node seen from the side relatively thick, subrectangular, tapering very little dorsally; seen from above its dorsal surface forms slightly more than a half-circle. Subpetiolar process well-developed, its apex sharply truncated.

Mandibles smooth and shining; clypeus somewhat less smooth, and feebly shining; remainder of head roughly shagreened and opaque. Pro- and mesonotum shagreened to contiguously punctate, and subopaque; episternum and various propodeal surfaces variably punctate and feebly shining to subopaque. Petiolar node mostly covered with scattered shallow punctures, feebly to

strongly shining. Gastric tergites contiguously punctate and subopaque.

Pilosity as in *P. caldonica* but in addition with a few short erect hairs on the occipital border, anterior pronotal angle, and anterior gastric tergital surfaces. Pubescence dense, short, predominantly oblique to appressed.

Head (except mandibles) medium brown; alitrunk, petiole, and gaster light brown, the gaster a shade darker than the rest; mandibles and appendages light brown.

*Worker paratype variation.* HW 0.40-0.41 mm, HL 0.48-0.50 mm, SL 0.33-0.35 mm, CI 80-83, SI 81-87, PW 0.29-0.32 mm. The unusual mandibular dentition described for the holotype occurs in most of the paratype workers. In several it is modified by the addition of one or two smaller intercalary teeth or denticles on the basal half of the masticatory border. In several others the two principal teeth of the basal half are reduced to the size of normal (for the *tenuis* group) denticles.

*Queen paratypes.* HW 0.43-0.45 mm, HL 0.51 mm, SL 0.35-0.36 mm, CI 84-86, SI 80-82, dorsal petiole width 0.23-0.24 mm. Differing from the worker caste by the usual queen-worker differences. Compound eyes well developed, at least 0.29 mm in maximum length. Petiolar node notably more slender in side view; seen from above its dorsal surface forms distinctly less than a half-circle. Coloration similar to that of worker.

*Male paratype.* HW 0.43 mm, HL 0.45 mm, maximum eye length 0.21 mm, dorsal petiole width 0.14 mm. Not differing fundamentally in morphology from known *Ponera* males outside the *tenuis* group. Antennae 13-jointed. Mandibles much reduced, only about 0.06 mm in length, edentate, with rounded apices. Petiolar node seen from the side forming roughly an isosceles triangle, with slightly concave anterior and posterior faces and rounded dorsal crest; seen from above, circular in outline. Genitalia exerted. Parameres small, 0.14 mm in length (measured from distalmost edge of basiparamere to tip of paramere), tapering distally to a pointed apex. Penis valves large, prominent, extending nearly 0.1 mm beyond the dorsal margin of the parameres, their dorsal borders strongly convex, almost semicircular.

Entire body covered with abundant, relatively short (length

never exceeding 0.06 mm) oblique to erect hairs, which merge into the equally abundant underlying oblique pubescence. Appendages almost entirely lacking pilosity, supplied instead with dense, predominantly oblique pubescence.

Body uniformly dark brown; appendages light to medium brown; wings lightly and uniformly infumated.

*Relationships.* This species is closely allied to *P. tenuis* (Emery) and *P. ratardorum* Wilson (*q.v.*).

*Material examined.* *P. huonica* has thus far been collected only in a limited area in the mountainous region around the headwaters of the Mongi River, Huon Peninsula, northeast New Guinea. N-E NEW GUINEA: Ebabaang (type locality), 1300-1400 meters, April 16-18, 1955, 3 workers (E. O. Wilson, acc. no. 826) and nest series with 2 workers, 2 alate queens, and a male (acc. no. 827); Gemeheng, 1300-1500 m., April 11-13, 1955, worker, alate queen, dealate queen (Wilson, acc. no. 791); Joangeng, 1500 m., April 7-8, 1955, stray dealate queen (Wilson, acc. no. 746).

*Ecological notes.* Colonies taken at Ebabaang and Gemeheng were both small, containing probably less than 30 workers. The one at Ebabaang was found under the moss layer covering the upper surface of a large, soft, "rich-red" log. The Gemeheng colony was in a small log in the same stage of decomposition. At all localities the species was found in partly open areas at the edge of native trails running through dense, wet midmountain rainforest.

#### PONERA INCERTA (Wheeler)

*Pseudocryptopone incerta* Wheeler, 1933, Amer. Mus. Nov., no. 672: 18-19, fig. 7, worker, queen. Type locality: Depok, Java.

The head of the unique worker type is now unfortunately missing, so that exact measurements of cephalic and antennal proportions could not be taken. In the present diagnosis cephalic characters are taken from Wheeler's original description.

PW 0.29 mm, petiole height 0.29 mm, petiole node length 0.15 mm, dorsal petiole width 0.22 mm. Mandibles with three apical teeth, behind which the masticatory border is "finely and indistinctly crenulate" (denticulate?). Antennal club 5-jointed. Petiolar node seen from directly above forming dis-

tinety less than a half-circle, with a shallowly concave posterior border. Subpetiolar process well developed, its apical angle acute.

Body sculpturing approximately as in *P. huonica* Wilson (*q.v.*)

Body pilosity pattern as in *P. caledonica* Wilson. Pubescence dense, short, predominantly appressed.

Body color uniformly yellowish ferruginous; legs clear yellow.

*Relationships.* This species is probably most closely related to *P. ratardorum* Wilson, from which it can be distinguished by slight differences in the antennal club composition and in petiolar node shape, and by a strong color difference. It bears a close habitus resemblance to *P. szaboii*, but can be easily distinguished from that species by its 5-jointed antennal club, thinner petiolar node, and somewhat more strongly shagreened alitruncal dorsum.

*Material examined.* JAVA: Depok, worker holotype.

#### PONERA PETILA Wilson, n. sp.

*Holotype worker.* HW 0.32 mm, HL 0.41 mm, SL 0.28 mm, CI 78, SI 88, PW 0.25 mm, petiolar height 0.25 mm, petiolar node length 0.13 mm, dorsal petiole width 0.18 mm. Very similar to *P. szentivanyi* Wilson, differing slightly in body and appendage proportions as given in the measurements cited above, and in the much feebler body sculpturing, which can be described as follows. Sides of head densely but shallowly punctate, and feebly shining. Entire dorsal and lateral surfaces of the alitrunk with puncturation or shagreening of variable density but everywhere shallow and feeble, so that the surface is feebly to strongly shining. The gastric tergites are also more feebly sculptured than in *szentivanyi* and their surfaces overall feebly shining.

*Relationships.* Closely resembling *P. szentivanyi* Wilson, as detailed in the comparative description of that species to follow.

*Material examined.* N-E. NEW GUINEA: lower Busu River, near Lae; May 10, 1955; a single worker (Wilson, acc. no. 999).

*Ecological note.* The single worker was collected as a stray in the superficial layers of soil beneath a rotting log on the ground in primary lowland rainforest.

## PONERA RATARDORUM Wilson, n. sp.

*Holotype worker.* HW 0.37 mm, HL 0.47 mm, SL 0.31 mm, CI 79, SI 84, PW 0.29 mm, petiole height 0.28 mm, petiolar node length 0.15 mm, dorsal petiole width 0.20 mm. Mandibles with three well developed teeth occupying about the apical two-fifths of the masticatory border; the remainder of the border occupied by a series of minute denticles. Eye minute, consisting of a single ommatidium, located approximately 0.8 the distance from the lateral occipital border to the midpoint of the anterior genal border. Antennal club massive, indistinctly 5-jointed. Petiolar node seen from side subrectangular, tapering almost imperceptibly dorsally, the dorsal surface feebly convex; the dorsal surface seen from directly above forms distinctly less than a half-circle, and the posterior nodal border is almost perfectly straight. Subpetiolar process well developed, its apical angle acute.

Sculpturing very similar to that described for *P. huonica*.

Pilosity and pubescence as described for *P. caledonica*. Body medium brown, the head and gaster a shade darker than the alitrunk and petiole. Appendages clear yellow.

*Worker paratype variation.* New Britain and New Hebrides: HW 0.36-0.38 mm, HL 0.46-0.48 mm, SL 0.30-0.32 mm, CI 78-80, SI 83-86, PW 0.27-0.30 mm. Carolines: HW 0.38 mm, HL 0.49 mm, SL 0.33 mm, CI 88, SI 87, PW 0.29 mm.

*Relationships.* This species most closely resembles *P. incerta* (Wheeler) of Java, differing in its darker color, distinctly 5-jointed antennal club (versus indistinctly 5-jointed in *incerta*), and straight posterior face of petiolar node. Superficially *P. ratardorum* resembles *P. huonica* Wilson and *P. tenuis* (Emery) but can be readily distinguished from these two species by its 5-jointed antennal club and much thinner petiolar node.

*Material examined.* NEW BRITAIN: St. Paul's, Baining Mts., Gazelle Peninsula, 350 m. (type locality); Sept. 5, 1955; holotype and three paratype workers (J. L. Gressitt). NEW HEBRIDES: Ratard Plantation, 8 km. southwest of Luganville, Espiritu Santo; Jan. 7-13, 1955; two paratype workers (Wilson, acc. no. 348). CAROLINES: Yap I., one paratype worker (R. J. Goss). The holotype and two paratypes have been returned to the Bishop Museum, Honolulu; the four remaining paratypes have

been deposited in the Museum of Comparative Zoology and U. S. National Museum.

This species is named in honor of Aubert and Suzanne Ratard, of Noumea and Luganville, the writer's gracious hosts during his brief stay in the New Hebrides.

*Ecological notes.* Dr. Gressitt's New Britain specimens were taken from a rainforest humus berlesate. The present writer's New Hebrides specimens were found foraging during the day in leaf litter on the floor of primary coastal rainforest.

#### PONERA SWEZEYI (Wheeler)

*Pseudocryptopone swezeyi* Wheeler, 1933, Amer. Mus. Nov., no. 672: 16-17, fig. 6, worker, queen. Type locality: vicinity of Honolulu, Hawaii.

The following measurements and descriptive notes are based on three worker syntypes in the Museum of Comparative Zoology.

HW 0.29-0.30 mm, HL 0.38-0.41 mm, SL 0.25-0.26 mm, CI 72-78, SI 84-85, PW 0.21-0.24 mm, petiole height (single measurement) 0.24 mm, dorsal petiole width 0.18 mm. Mandible with three distinct apical teeth occupying slightly less than half the masticatory border; the remainder of the border bearing an indeterminate number of minute denticles. Antennal club distinctly 5-jointed. Petiolar node seen from directly above forming slightly more than a half-circle. Subpetiolar process well developed, its apex right-angular.

Sculpturing about as in *P. caledonica* except that on the alitrunk only the declivitous faces of the propodeum are smooth and shining, the remainder of the alitruncal surfaces being lightly shagreened and only feebly shining.

Body colorous light brownish yellow; appendages clear yellow.

*Relationships.* This distinctive little species does not appear to be closely related to any of the other known members of the *tenuis* group.

*Material examined.* HAWAII: vicinity of Honolulu, 3 syntype workers (R. H. Van Zwaluwenburg); Herring Valley, Honolulu (F. X. Williams).

*Note on distribution.* This species is known only from material collected in the vicinity of Honolulu. The habitat of the type series, "soil of cultivated and fallow sugar-cane fields," suggests



that it may have been introduced by man into the Hawaiian Islands. Future collecting may show that its native range lies somewhere in the "source areas" of Melanesia or the East Indies.

PONERA SZABOI Wilson, nom. nov.

*Cryptopone mocsáryi* Szabó, 1910, Rovartani Lap., 17: 186, fig. 1, worker.

Secondary homonymy by present assignment to *Ponera* (nec *Ponera mocsáryi* Emery, 1900). Type locality: Friedrich-Wilhelmshafen (=Madang), N-E. New Guinea.

*Pseudocryptopone mocsáryi*, Wheeler, 1933, Amer. Mus. Nov., no. 672:14.

The description offered below is based on two workers collected by myself in the vicinity of the lower Busu River, N-E. New Guinea. These correspond well to Szabó's description and figure, differing only in having somewhat more elongate heads than shown by Szabó.

HW 0.30-0.31 mm; HL 0.40 mm; SL 0.25 mm; CI 76-78; SI 79-83; PW 0.23 mm; petiole height (single measurement) 0.24 mm; petiolar node length 0.15 mm; dorsal petiole width (single measurement) 0.15 mm. Mandible linear-subtriangular. The apical half of the masticatory border occupied by three distinct, acute teeth; the basal half occupied by an indeterminate number of minute denticles. Eyes minute, consisting of a single ommatidium. Antennal club massive, distinctly 4-jointed, considerably longer than the entire remainder of the funiculus. Head in full-face view subrectangular, with very feebly convex sides and feebly concave posterior border. Petiolar node seen from the side relatively thick, tapering slightly dorsally, with a feebly convex dorsal border; seen from directly above, with the posterior face aligned with the plane of vision, the node forms distinctly more than a half-circle, and the posterior border appears almost perfectly straight. Subpetiolar process well-developed, its apical angle obtuse.

Mandibles smooth and shining; clypeus smooth and feebly shining; remainder of head finely and evenly shagreened and subopaque. All of alitruncal surfaces finely shagreened and subopaque, except the episterna and declivitous faces of the propodeum, which bear only scattered fine punctures and are relatively smooth and more or less shining. Various surfaces of the petiolar node bearing variably dense but fine and separated

punctures, and otherwise smooth and more or less shining. Gastric tergital surfaces shagreened and subopaque, except for the anterior declivity of the first gastric tergite, which is smoother and feebly shining.

Pilosity and pubescence as described for *P. caledonica* Wilson.

Alitrunk and petiole yellowish brown; head and gaster somewhat darker, approaching medium brown; appendages nearly clear yellow.

*Relationships.* In its distinctive combination of characters in size, petiole form, and body color, *szaboi* stands well apart from all the other known species of the *tenuis* group.

*Material examined.* N-E. NEW GUINEA: lower Busu River, near Lae, 2 workers (Wilson, acc. nos. 963, 1024).

*Ecological note.* Both of the Busu River specimens were taken as strays on the floor of primary lowland rainforest.

PONERA SZENTIVANYI Wilson, n. sp.

*Holotype worker.* HW 0.34 mm; HL 0.45 mm, SL 0.32 mm, CI 76, SI 94, PW 0.28 mm (petiole height not measured; see paratype), petiolar node length 0.16 mm, dorsal petiole width 0.24 mm. Three well developed teeth occupying the apical two-fifths of the masticatory border, followed basally by an indeterminate number of minute denticles. Eye minute, consisting of a single ommatidium, located about 0.8 the distance from the lateral occipital border to the midpoint of the anterior genal border. Antennal club distinctly 4-jointed, considerably longer than the remainder of the funiculus. Head elongate (CI 76) with very feebly convex sides, and feebly but distinctly concave occipital border. Petiolar node seen from side relatively thin, elongate-trapezoidal; seen from directly above, so that the posterior face is exactly parallel with the line of vision, the node as a whole forms slightly more than a half-circle, but the dorsal surface alone forms much less than a half-circle; seen from the preceding position the posterior face is feebly but distinctly concave. Subpetiolar process somewhat reduced, its apex right-angular.

Body sculpturing approximately as described for *P. huonica* Wilson.

Pilosity and pubescence as in *P. caledonica* Wilson.

Body uniformly light brownish yellow; appendages clear yellow.

*Paratype worker.* A single callow worker taken with the holotype has the integument of the head somewhat crumpled and distorted through drying, so that regular cephalic measurements could not be made. PW 0.28 mm, petiole height 0.29 mm, dorsal petiole width 0.21 mm. Body color clear, pale yellow.

*Relationships.* This species most closely resembles *P. petila* Wilson, as indicated under the comparative description of that species. Together *szentivanyi* and *petila* form a subgroup of their own within the *tenuis* group, characterized in the worker caste by intermediate size, slender body form with elongate head, thin petiolar node, and brownish yellow body color. They are closest to the subgroup formed by *P. caledonica* Wilson and *P. exedra* Wilson, from which they can be distinguished by their smaller size and thinner petiolar node.

*Material examined.* PAPUA: Karema, near the Brown River, about 30 miles north of Port Moresby; March 8-11, 1955; holotype and single paratype worker (Wilson, acc. no. 563). This species is named in honor of Dr. J. H. Szent-Ivany, the expert resident entomologist of the Territory of Papua-New Guinea, whose friendly assistance greatly aided the author's field work in this area.

*Ecological note.* The two type workers were taken close together on the floor of primary lowland rainforest.

### PONERA TENUIS (Emery)

*Cryptopone tenuis* Emery, 1900, Természetr. Füzet., 23: 321-322, pl. 8, figs.

21, 22, worker. Original localities: Lemien, near Berlinhafen (=Aitape), and Tamara I., N-E. New Guinea.

*Pseudocryptopone tenuis*, Wheeler, 1933, Amer. Mus. Nov., no. 672: 13-14.

*Lectotype worker.*<sup>1</sup> HW 0.44 mm, HL 0.52 mm, SL 0.35 mm, CI 85, SI 80, PW 0.32 mm, petiole height 0.32 mm, petiolar node length 0.17 mm, dorsal petiole width 0.22 mm. Right mandible with three<sup>2</sup> rather worn, indistinct teeth occupying the apical half of the masticatory border; followed by an indeterminate number of minute, blunt denticles occupying the basal half of

<sup>1</sup> By present selection, a syntype worker in the Emery Collection, kindly loaned to the author by Dott. Delfa Guiglia.

<sup>2</sup> Not four as stated by Emery in the original description.

the border. Eyes minute, consisting of a single ommatidium. Antennal club massive, distinctly 4-jointed, considerably longer than the remainder of the funiculus. Petiolar node seen from the side subtrapezoidal, tapering slightly dorsally, with a convex dorsal margin, its dorsal surface seen from directly above forming almost exactly a half-circle or very slightly less. Anterior half of subpetiolar process perforated by a small, median hole; the posterior apex of the process forming an acute angle.

Sculpturing as described for *P. huonica* Wilson.

Pilosity and pubescence as described for *P. huonica*, except that erect hairs are lacking from the occiput and pronotum; these missing hairs may well have been rubbed off in this specimen, because they are present in more recently collected material determined as *tenuis*.

Body uniformly yellowish brown, appendages clear yellow (specimen possibly faded; see below).

*Variation in other worker series.* The following measurements are based on three workers from a single nest series collected at Ebabaang: HW 0.42-0.43 mm, HL 0.49-0.52 mm, SL 0.33-0.35 mm, CI 82-86, SI 78-83, PW 0.32 mm. In these specimens the anterior half of the subpetiolar process is not perforated as in the lectotype, and the posterior angle of the process forms a right angle instead of an acute angle. The body color is uniformly blackish brown, and the appendage color is light yellowish brown; there is an excellent possibility that the considerably lighter color of the lectotype is due to fading.

*Queen* (tentative determination). HW 0.50 mm, HL 0.58 mm, SL 0.40 mm, CI 86, SI 80, dorsal petiole width 0.27 mm. Differing from the worker by the usual formicid queen-worker differences. Maximum eye length 0.15 mm. Petiolar node much thinner than in worker, seen from directly above forming much less than a half-circle. Distinguished from the queen of *P. huonica* by its larger size, darker body color (uniformly blackish brown as opposed to predominantly medium brown in *huonica*), and somewhat thinner petiolar node.

*Relationships.* *P. tenuis* most closely resembles *P. huonica* Wilson, from which it differs principally in its more conventional mandibular dentition, thinner petiolar node, differently shaped subpetiolar process, and darker body color. Together these two species bear a close habitus resemblance to *P. clavicornis* Emery,

and may in fact provide a link between the *tenuis* and *selenophora* species groups.

*Material examined.* N-E. NEW GUINEA: (Lemien or Tamara I.), lectotype worker; Ebabaang, Mongi River Watershed, 1300-1400 m., 3 workers (Wilson, acc. no. 828); Joangeng, near Ebabaang, 1500 m., a stray dealate queen (Wilson, acc. no. 746).

*Ecological note.* The Ebabaang workers were found foraging during the day in leaf litter on the floor of midmountain rain-forest.

#### PONERA ZWALUWENBURGI (Wheeler)

*Pseudocryptopone zwaluwenburgi* Wheeler, 1933, Amer. Mus. Nov., no. 672: 14-16, fig. 5, worker. Type locality: Oahu Island, Hawaii (by present selection).

The following measurements and descriptive notes are based on four worker syntypes in the Museum of Comparative Zoology.

HW 0.44-0.47 mm, HL 0.53-0.59 mm, SL 0.38-0.42 mm, CI 81-84, SI 87-88, PW 0.32-0.35 mm, petiole height (single measurement) 0.28 mm, dorsal petiole width 0.20-0.23 mm. Mandibles with three well developed teeth occupying less than half the masticatory border, the remainder being occupied by an indeterminate number of minute denticles. Antennal club indistinctly 5-jointed. Petiolar node seen from directly above forming distinctly more than a half-circle. Subpetiolar process reduced to a mere convexity.

Entire body finely and densely shagreened and subopaque, except the mandibles, posterior face of the propodeum, and posterior face of the petiolar node, which are relatively smooth and shining.

Short erect hairs numerous on anterior scape surface, entire dorsum of alitrunk, petiolar dorsum, and entire surfaces of exposed gastric tergites. Pubescence everywhere abundant, almost entirely appressed.

Body and appendages concolorous clear yellow.

*Relationships.* This species, marked by its combination of large size, lack of eyes, abundant erect pilosity, and pale color, does not appear to stand close to any of the other species of the *tenuis* group.

*Material examined.* HAWAII: Oahu, four syntype workers.

This species is known only from the type material, which was collected at several localities on Oahu and on Maui. As in *P. swezeyi*, the collections were all made from the soil of cultivated and fallow sugar-cane fields, a circumstance which suggests that the species may have been introduced into Hawaii by man.

Characterization of the *Ponera selenophora* group

*Worker*. Medium-sized species, worker head width ranging between 0.43 and 0.68 mm. Mandibular dentition variable, in most cases consisting of three distinct teeth occupying the apical two-fifths to one-half of the masticatory border, followed by a series of minute denticles; in one case (*selenophora*) the basal half of the border bears two distinct teeth in addition to the denticles. Eyes usually small, with 3-5 indistinct facets; in one case (*elegantula*) there are 11-12 facets. Junction of posterior and lateral faces of propodeum marginate, forming an angle of 80° to slightly less than 90°. Petiolar node massive and exceptionally broad, its dorsal width never less than 0.77 × the pronotal width and usually much more; arcuate or crescentic, with the junction of the anterior and posterior faces usually marginate. Subpetiolar process very variable in shape, from well developed and angular or subangular to rudimentary and rounded; when well developed, its apex generally projects posteriorly.

Key to the species of the *Ponera*

*selenophora* group, based on the worker

1. Small species, head width 0.43-0.47 mm; dorsum of alitrunk completely devoid of standing hairs; (New Guinea to New Hebrides) .....  
.....*clavicornis* Emery
- Larger species, head width 0.50 mm or greater; dorsum of alitrunk either covered by abundant standing hairs (usually) or else completely devoid of standing hairs (the latter condition only in one species from New Guinea) .....2
2. Entire lateral surface of the propodeum completely sculptured and opaque; (a larger species, head width 0.62-0.64 mm, with unusually long scapes, scape index 90-93); (Japan) .....*scabra* Wheeler
- A large part of the lateral faces of the propodeum smooth and shining; (species variable in size, with shorter scapes, scape index 89 or less) .....3



3. (Based on unique type). Head more elongate (cephalic index 80), with relatively large eyes containing 11 or 12 distinct facets; alitrunk completely devoid of standing hairs; (mountains of northeastern New Guinea) ..... *elcgantula* Wilson, n. sp.  
 Head proportionately shorter (cephalic index 86 or greater), with smaller eyes containing only 3-5 indistinct facets; alitrunk covered with abundant standing hairs ..... 4
4. Smaller species (head width 0.50 mm) with proportionately short head (cephalic index 92-94); antennal club indistinctly 4-jointed; (Philippines) ..... *oreas* (Wheeler)  
 Either slightly larger species (head width 0.52-0.54 mm) with much longer head (cephalic index 85-87), or much larger species (head width 0.59 mm or greater) with head equally long to much longer (cephalic index 86-92); antennal club either 5-jointed or completely undifferentiated ..... 5
5. Posterior face of petiolar node feebly but distinctly convex; a relatively small species (head width of unique type 0.52 mm) from the mountains of northeastern New Guinea ..... *syscena* Wilson, n. sp.  
 Posterior face of petiolar node flat or feebly concave ..... 6
6. Smaller species (head width of unique type 0.54 mm); anterior surface of scape with abundant erect hairs; antennal club indistinctly 5-jointed; (Hongkong) ..... *sinensis* Wheeler  
 Larger species (head width 0.59 mm or greater); erect hairs scarce to absent on anterior surface of scape; antennal club undifferentiated ..... 7
7. Smaller species (head width 0.59-0.63 mm); basal half of masticatory border bearing two distinct teeth which are nearly as large as the three teeth of the apical half; posterior border of petiolar node, seen from directly above, distinctly concave; (lowland rainforests of Papua and northeastern New Guinea) ..... *selenophora* Emery  
 Larger species (head width 0.65-0.68 mm); basal half of masticatory border bearing only minute denticles which do not approach in size the three apical teeth; posterior border of petiolar node, seen from directly above, straight; (mountains of northeastern New Guinea) ..... *xenagos* Wilson, n. sp.

PONERA CLAVICORNIS Emery

*Ponera clavicornis* Emery, 1900, Természetr. Füz., 23: 317, pl. 8, figs. 7, 8, worker. Type locality: Friedrich-Wilhelmshafen (=Madang), N-E. New Guinea.

*Ponera clavicornis*, Mann, 1919, Bull. Mus. Comp. Zool., 63: 296.

*Selenopone clavicornis*, Wheeler, 1933, Amer. Mus. Nov., no. 672: 22.

*Worker.* HW 0.43-0.47 mm, HL 0.52-0.59 mm, SL 0.35-0.42 mm, CI 81-85, SI 80-89, PW 0.32-0.37 mm, dorsal petiole width 0.27-0.32 mm. Mandibles with three well developed teeth occupying about the apical half of the masticatory border; the basal half occupied by an indeterminate number of minute denticles. Eye as described for *P. selenophora*. Antennal club relatively slender, 5-jointed. Posterolateral margins of propodeum relatively poorly defined, seen from directly above forming an angle of only slightly less than  $90^\circ$ . Posterior face of petiolar node seen from directly above almost perfectly straight. Subpetiolar process variable in shape, ranging from a rudimentary convexity to a strong right-angular projection.

Mandibles smooth and shining; clypeus feebly shagreened and shining over most of its surface; entire remainder of the head densely, finely, and evenly punctate (the punctures mostly under 0.01 mm in diameter) and completely opaque. Entire dorsal and lateral alitruncal surfaces similarly punctate and opaque, except for the ventral margins of the sides of the pronotum, a limited central longitudinal strip on the sides of the propodeum, and the lower half of the posterior propodeal face, which surfaces are more or less smooth and shining. Dorsal and lateral surfaces of petiolar node somewhat less densely punctate than head and alitrunk, subopaque; anterior and posterior faces more or less smooth and shining. First several gastric tergites also somewhat less densely punctate, subopaque to feebly shining.

Pilosity completely lacking on head and alitrunk except for a few erect hairs on the mandibles, clypeus, and frontal lobe area. Petiolar node and first two gastric tergites bare to sparsely pilose; terminal gastric tergites and all gastric sternites abundantly pilose.

Body (except mandibles and apical gastric segments) piceous brown, approaching jet black. Mandibles, apical gastric segments, and appendages yellowish brown.

*Geographic variation.* The series from Espiritu Santo, New Hebrides, have somewhat longer scapes than those from New Guinea (SI 86-89 as opposed to 80-84).

The series from Bisianumu, Papua, have the first two gastric tergites pilose; in side view 5-10 standing hairs are visible along the profile of the first tergite. The series from Tumnang, N-E. New Guinea, and from the New Hebrides have the first two

gastric tergites bare of pilosity. The series from Bubia, N-E. New Guinea, a geographically intermediate locality, has the tergites intermediately pilose: 1-3 standing hairs are visible along the profile of the first tergite.

*Relationships.* This is a very distinct species, easily separated in the worker caste from other members of the *selenophora* group by the combination of smaller size, distinctive sculpturing, and sparse body pilosity.

*Material examined.* PAPUA: Bisianumu, 500 m., March 15-20, 1955 (Wilson, acc. nos. 608, 626, and 648, the last with winged queens). N-E. NEW GUINEA: Madang, syntype worker (Emery Coll.); Bubia, 13 km. northwest of Lae, March 26, 1955 (Wilson acc. no. 680); lower Busu River, May 1955 (Wilson acc. no. 1006); Tumnaung, Mongi River Watershed, 1500 m., April 14-15, 1955 (Wilson acc. no. 798). SOLOMONS: Santa Isabel (Mann, 1919). NEW HEBRIDES: A. Ratard Plantation, 8 km. southwest of Luganville, Espiritu Santo, January 7-13, 1955 (Wilson acc. no. 348); Malua Bay, Malekula (L. E. Cheesman). My accessions no. 608 and no. 798 were compared directly with a worker syntype in the Emery Collection.

*Ecological notes.* This is an exceptionally adaptable and widespread species. It has been collected from primary lowland rainforest (Espiritu Santo), second-growth lowland rainforest (Bubia), foothills forest (Bisianumu), and true midmountain forest (Tumnaung), under a variety of local ecological conditions.

My accession no. 608 (Bisianumu) was a small colony found nesting under the bark of a large "passalid-stage" log on the ground; larvae at various stages of development and cocoons were present. The other two Bisianumu accessions and the Bubia accession consisted of stray workers, also from large passalid-stage logs. The Tumnaung and New Hebrides specimens were taken as strays in leaf litter on the forest floor.

#### PONERA ELEGANTULA Wilson, n. sp.

*Holotype worker.* HW 0.56 mm, HL 0.70 mm, SL 0.49 mm, CI 80, SI 87, PW 0.43 mm, petiolar node length 0.38 mm, dorsal petiole width 0.38 mm. Apical half of masticatory border of (left) mandible occupied by three well-developed teeth; posterior half occupied by six irregular denticles. Eyes relatively large,

maximum length 0.06 mm, with eleven or twelve distinct facets. No distinct antennal club differentiated; funicular segments from the third outward gradually increasing in length and width. Head subrectangular, its sides feebly convex, its posterior border feebly concave. Posterolateral margins of propodeum distinct but rounded, seen from above forming only slightly less than a 90° angle. Petiolar node in side view considerably thinner than in any other *selenophora* group member, although exhibiting the form and exceptional transverse width typical for the group. Seen from directly above, the dorsal surface of the node is thin and arc-shaped.

Mandibles smooth and feebly shining; clypeus for the most part smooth and feebly shining. Remainder of head covered by punctures which are about 0.006 mm in diameter and separated from one another by about the same distance; its surface feebly shining. Dorsal surface of alitrunk covered by similar punctures somewhat more widely spaced, its surface feebly shining; punctures on sides of pronotum sparser, finer, the surface moderately shining; lower halves of episterna finely and very sparsely punctate, their surfaces strongly shining, upper halves finely shagreened and subopaque; lower halves of metapleura and of the sides of the propodeum shagreened and subopaque, upper halves finely and sparsely punctate and shining; posterior face of propodeum smooth and shining. Petiolar surfaces very sparsely punctate to smooth, moderately to strongly shining. Gastric tergites sculptured similarly to alitruncal dorsum.

Body pilosity very sparse, limited to anterior region of head, posterior strips of first two gastric tergites, entire surfaces of apical gastric tergites, and entire surfaces of all gastric sternites. Pubescence everywhere abundant and appressed.

Body color, excluding mandibles and apical gastric tergites, jet black. Mandibles, apical gastric tergites, and appendages yellowish brown.

*Paratype queen.* HW 0.62 mm, HL 0.76 mm, SL 0.53 mm, CI 82, SI 86. Distinguished from the worker by the usual queen-worker caste differences. Maximum eye length 0.16 mm. Unlike the queens of other members of the *tenuis* and *selenophora* groups, the queen of *elegantula* does not have a proportionately more slender petiolar node than the worker.

*Relationships.* This species, with its distinctively large eye

size and relatively slender petiolar node, does not appear to be closely related to any of the other members of the *selenophora* group.

*Material examined.* N-E. NEW GUINEA: Tummang, Mongi River Watershed, Huon Peninsula, 1500 m.; April 14-15, 1955; one worker and one dealate queen (Wilson, acc. no. 799).

*Ecological note.* The two type specimens were taken together under the bark of a rotting log in midmountain rainforest.

#### PONERA OREAS (Wheeler)

*Selenopone orcas* Wheeler, 1933, Amer. Mus. Nov., no. 672: 20-21, fig. 8, worker. Type locality: Cuernos Mts., 1300 m., near Dumaguete, Negros Oriental, Philippines.

*Worker.* HW 0.50 mm, HL 0.54 mm, SL 0.39 mm, CI 93, SI 78, PW 0.36-0.38 mm, dorsal petiole width 0.29-0.31 mm. Closely related to the members of the *selenophora* "subgroup" (see under *selenophora*) and distinguished principally by the following characters:

- (1) Somewhat smaller size.
- (2) The antennal club is four-jointed; the fifth funicular segment from the apex is slightly larger than the succeeding basal segments, but still not large enough to be considered part of the club, as is the case in *P. sinensis*.
- (3) The head is proportionately shorter than in any other member of the *selenophora* group.

*Relationships.* See comparative description above.

*Material examined.* PHILIPPINES: Cuernos Mts., four syntype workers.

#### PONERA SCABRA Wheeler

*Ponera scabra* Wheeler, 1928, Boll. Lab. Zool. Portici, 21: 99-100, worker, queen. Type locality: Mt. Maya, Japan (present selection).

*Worker.* HW 0.62-0.64 mm, HL 0.77-0.80 mm, SL 0.56-0.59 mm, CI 78-82, SI 90-93, PW 0.46-0.50 mm, dorsal petiole width 0.39-0.42 mm. This species falls close to the *selenophora* "subgroup" (see under *selenophora*), and can easily be distinguished from it by the following two characters:

- (1) The head is proportionately longer (maximum CI is 82 as opposed to a minimum of 85 in the *selenophora* subgroup).

(2) The entire alitrunk, except the posterior surface of the propodeum, is coarsely and irregularly shagreened and subopaque to opaque.

*Relationships.* See comparative description above.

*Material examined.* JAPAN: Mt. Maya, Honshu, six syntype workers.

#### PONERA SELENOPHORA Emery

*Ponera selenophora* Emery, 1900, Természetr. Füzet., 23: 317, pl. 8, figs. 4, 6, worker. Type locality: Lemien, near Berlinhafen (Aitape), N-E. New Guinea.

*Solenopona selenophora*, Wheeler, 1933, Amer. Mus. Nov., no. 672: 21.

*Worker.* HW 0.59-0.63 mm, HL 0.66-0.69 mm, SL 0.52 mm, CI 88-92, SI 82-89, PW 0.46-0.49 mm, dorsal petiolar width 0.40-0.42 mm. Mandibles with three relatively large, well-developed teeth occupying the apical half of the masticatory border; the basal half occupied by two smaller teeth, one located midway between the basalmost of the apical teeth and the basal angle, and the other on the basal angle. In addition, there are several irregular denticles in the interdentary spaces of the basal half of the border. Eyes minute, consisting of two or three small, ill-defined ommatidia, located approximately 0.8 the distance from the lateral occipital border to the midpoint of the anterior genal border. The antenna lacks a well-defined club, the funicular segments merely increasing gradually in length and width from the fourth outward. Posterolateral margins of propodeum (line of juncture of posterior and lateral faces) well marked, seen from directly above forming an angle of about 80°. Posterior border of petiole when viewed from directly above distinctly concave. Subpetiolar process well developed, approximately right-angular.

Mandibles and most of clypeus smooth and shining. Entire rest of head covered by contiguous punctures about 0.01 mm or slightly less in diameter, completely opaque. Entire dorsum of alitrunk covered by punctures about 0.006 mm in diameter, separated by spaces of about the same width as the diameter of the punctures, the surface feebly shining. Lateral thoracic surface covered by punctures of variable size, most with diameter under 0.01 mm, the majority contiguous; the surface subopaque.



The lateral and posterior propodeal faces bear only a few peripherally distributed punctures and are mostly smooth and shining. Petiolar node with sparse scattered punctures, its surface entirely smooth and shining.

Short, erect hairs present on mandibles, clypeus, frontal lobe area, entire dorsal alitruneal surface, posterolateral propodeal margins, dorsal petiolar surface, and entire surfaces of first two gastric segments. Apical gastric segments covered by more abundant, much longer hairs. Pubescence almost everywhere abundant, predominantly oblique to appressed.

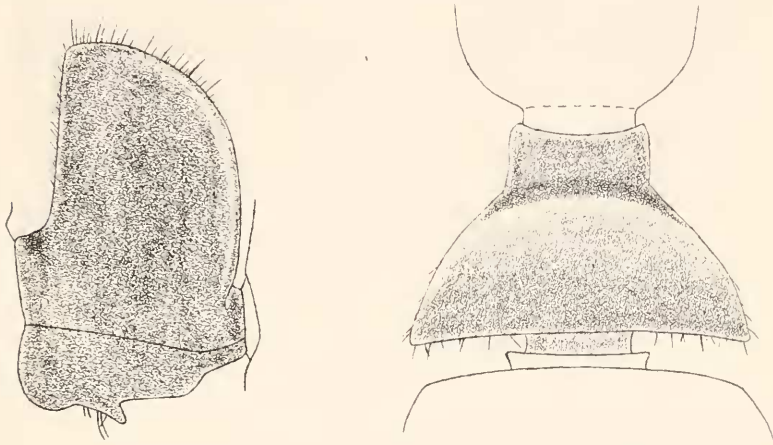


Fig. 3. Lateral and dorsal views of the worker petiole of *Ponera selenophora* Emery. Based on a worker from Karema, Papua, which had been compared with a syntype in the Emery Collection.

Entire body jet black, except mandibles and apical gastric segments, which are brownish yellow. Appendages variably brownish yellow.

*Relationships.* Inside the *selenophora* group, *P. selenophora* falls within the closely knit subgroup which also includes *P. xenagos* Wilson, *P. syscena* Wilson and *P. sinensis* Wheeler. Distinguishing characters are supplied in the respective comparative descriptions of these latter species.

*Material examined.* N-E. NEW GUINEA: Lemien, near Berlinhafen (=Aitape), syntype worker; lower Busu River, near

Lae, April 28, 1955 (E. O. Wilson, acc. no. 564). PAPUA: Karema, near Brown River, March 8-11, 1955 (Wilson, acc. no. 564). NETH. NEW GUINEA: Maffin Bay, June, 1944, a single dealate queen (E. S. Ross). The Karema specimens have been compared directly with a worker type in the Emery Collection.

*Ecological note.* Both of the author's collections were made on the floor of primary lowland rainforest.

#### PONERA SINENSIS Wheeler

*Ponera sinensis* Wheeler, 1928, Boll. Lab. Zool. Portici, 22: 6-7, worker.

Type locality: Hongkong.

*Holotype worker.* HW 0.54 mm, HL 0.62 mm, SL 0.45 mm, CI 87, SI 83, PW 0.41 mm, dorsal petiole width 0.35 mm. Very close to *P. selenophora* and *P. syscena*, differing primarily by the following combination of characters:

- (1) Intermediate size.
- (2) Apical five segments of antenna differentiated as a club.
- (3) Posterior face of petiolar node feebly but distinctly concave, approximately intermediate between *selenophora* and *xenagos*.
- (4) Pilosity and pubescence approximately as described for *syscena*.
- (5) Propodeal margination as described for *xenagos*.
- (6) Basal half of masticatory border of mandible bearing only denticles.

*Relationships.* See comparative description above.

*Material examined.* Hongkong, holotype worker.

#### PONERA SYSCENA Wilson, n. sp.

*Holotype worker.* HW 0.52 mm, HL 0.61 mm, SL 0.45 mm, CI 85, SI 87, PW 0.40 mm, petiolar height 0.39 mm, petiolar node length 0.26 mm, dorsal petiole width 0.31 mm. Closely related to *P. selenophora* Emery and *P. sinensis* Wheeler, differing primarily by the following combination of characters:

- (1) Small size, distinctly smaller than the probably sympatric *P. selenophora* but scarcely smaller than *P. sinensis*.
- (2) Dorsal petiole width only 0.78X the pronotal width, as opposed to at least 0.82X in *selenophora* and *sinensis*. Posterior

face of petiolar node feebly convex (feebly concave in *selenophora* and *sinensis*).

(3) Propodeal margination as described for *P. xenagos*.

(4) Body and appendages with considerably more abundant pilosity and pubescence than in *selenophora*. Thirteen to seventeen outstanding erect hairs can be counted along the outer surfaces of the scapes in the *syscena* type, whereas there are no more than five or six in *selenophora*. *P. sinensis* is close to *P. syscena* in this character.

(5) Dentition of basal half of masticatory border of mandible bearing only denticles.

*Relationships.* See comparative description above. Although this species closely resembles *P. selenophora* in most characters, it has a petiolar node form (*q. v.*) which is intermediate between the distinctive *selenophora* type and the more generalized type characterizing most of the species of *Ponera*.

*Material examined.* N-E. NEW GUINEA: native trail between Yunzain and Joangeng, Mongi Watershed, Huon Peninsula, 1300 m.; April 7, 1955; a single worker (Wilson).

*Ecological note.* The unique type was taken as a stray on the floor of midmountain rainforest.

#### PONERA XENAGOS Wilson, n. sp.

*Holotype worker.* HW 0.67 mm, HL 0.77 mm, SL 0.59 mm, CI 87, SI 88, PW 0.52 mm, petiole height 0.53 mm, petiolar node length 0.27 mm, dorsal petiole width 0.42 mm. Very similar to *P. selenophora* Emery, differing by the following characters:

(1) Larger size.

(2) The three apical mandibular teeth occupy less than half the masticatory border, and distinct teeth are not developed on the basal half of the border as described for *selenophora*.

(3) The posterolateral margins of the propodeum are less pronounced; viewed from directly above they form an angle of only a little less than 90°.

(4) When viewed from directly above, the posterior margin of the petiolar node is almost perfectly straight, as opposed to the distinctly concave margin of *selenophora*.

(5) Pubescence is generally sparser. The anterior face of the petiolar node has pubescence only over its upper quarter,

and there it is relatively sparse, whereas in *selenophora* it is abundant over the entire upper half.

*Paratype variation.* HW 0.65-0.68 mm, HL 0.75-0.80 mm, SL 0.57-0.60 mm, CI 86-90, SI 83-89, PW 0.52-0.54 mm, dorsal petiole width 0.40-0.44 mm.

*Relationships.* *P. xenagos* is the largest of the known species of the *selenophora* group. Within the group, it is most closely allied to *selenophora* itself, as indicated in the above comparative description.

*Material examined.* N-E. NEW GUINEA: Tumnang, 1500 m. (type locality), April 14-15, 1955, holotype and eight paratype workers (Wilson, acc. no. 801); Ebabaang, 1300-1400 m., April 16-18, 1955, three paratype workers (Wilson, acc. no. 819). Both of the above localities are in the Mongi River Watershed of the Huon Peninsula.

*Ecological notes.* The Tumnang colony was found nesting under the loose bark of a rotting stump. The Ebabaang colony was under the loose bark of the upper surface of a large rotting log, in the immediate vicinity of a colony of *Amblyopone australis* Erichson. Both nest sites were in partial clearings at the side of native trails running through dense midmountain rainforest.